


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604

DATE: JUN 6 2014

SUBJECT: Clean Air Act inspection at Waste Management of Illinois, Inc. –  
Milam Recycling and Disposal Facility in East St. Louis, Illinois

FROM: Monica Onyszko, Environmental Engineer  
Air Enforcement and Compliance Assurance Section (IL/IN)

Dakota Prentice, Environmental Engineer  
Air Enforcement and Compliance Assurance Section (IL/IN)

THRU: Nathan Frank, Chief   
Air Enforcement and Compliance Assurance Section (IL/IN)

TO: File

**Date of Inspection** April 22, 2014

**Attendees** Monica Onyszko, U.S. EPA, Region 5, Clean Air Act Air (CAA) Inspector  
Dakota Prentice, U.S. EPA, Region 5, CAA Inspector  
Ernest “Denny” Dennison, Waste Management of Illinois, Inc., Market  
Area Engineer  
Mike McElvain, Waste Management of Illinois, Inc., Gas Technician  
Alan Hunt, Waste Management of Illinois, Inc., Waste Management  
Renewable Energy Project Manager  
Roy Holland, Waste Management of Illinois, Inc., Gas-to-Electric Plant  
Manager

**Purpose of Inspection**

The unannounced inspection at Waste Management of Illinois, Inc. (WM) - Milam Recycling and Disposal Facility (Milam) was carried out due to targeting efforts done by Region 5's Air Programs branch and Air Toxics and Assessment branch for the Community-Based Workgroup for the Alton/East Alton, Illinois area. Milam was chosen for inspection because it reported hydrogen sulfide emissions. The inspection was carried out to assess the facility's compliance status with the CAA.

Additionally, Dakota Prentice and Monica Onyszko (U.S. EPA Inspectors) wanted to learn about Milam's landfill gas (LFG)-to-energy plant and inquire if WM has plans to expand the system.

## **Company Description and Background**

Physical Location: Milam Recycling and Disposal Facility  
601 Madison Road  
East St. Louis, Illinois 62201  
Phone Number: (314) 568-2025  
Primary Contact: Denny Dennison, Market Area Engineer

The most recent permit U.S. EPA Inspectors found for Milam was a Title V permit issued by the Illinois Environmental Protection Agency on November 20, 2002. Milam is permitted to operate a municipal solid waste landfill (with two areas - Old Milam and New Milam) and three LFG-fired internal combustion engines used to produce electricity, among other emission units. Milam is subject to 40 C.F.R. 60 Subpart WWW, Standards of Performance for Municipal Solid Waste Landfills, among other regulations.

Milam is located in St. Clair County, which was an area designated in 2013 as non-attainment for the 8-Hour Ozone 2008 and PM<sub>2.5</sub> 1997 standards (according to data posted on December 05, 2013 - the most current data publically available).

Based on EJScreen standard reports generated on May 8, 2014, Environmental Justice (EJ) concerns are raised for the facility. The facility (mapped 601 Madison Road, East St. Louis, Illinois; 0.5, 1 and 3-mile buffer rings) has three "USA Percentile" primary EJ indexes above the 80th percentile for a 1-mile radius and has twelve "USA Percentile" primary EJ indexes above the 80th percentile for a 3-mile radius.

## **Inspection Conference**

U.S. EPA Inspectors arrived at Milam at approximately 8:50 AM. Inside the main office trailer on site, they met Denny Dennison and presented their badges. They explained that they were at the facility to conduct a CAA inspection and tour the plant.

The conversation began with a history of the site. Mr. Dennison said that the landfill was privately owned in the 1960s. In 1978 it was owned by SCA Services. In 1984, WM took over. There are now two landfills at Milam. The older landfill on site is still accepting waste, with compost on top, but it is essentially near capacity. In the fall of 2013 there was a landfill expansion with a capacity of 16,800,000 cubic yards on an adjacent site that is known as North Milam. The landfill had been repermited as a minor source, but is now again a major source with the addition of North Milam. North Milam has an expected approximate 20 year lifespan. Between the two plants, there are about twenty employees on site.

When asked about air emission controls at the site, Mr. Dennison replied that there are several. There is an existing gas-to-electric plant that has been in place since about 1990. The plant has the capacity handle 900 standard cubic feet per minute (scfm) of LFG. The plant has three engines, each of which is able to handle 300 scfm. The plant started out with two engines and a third was added. Engines have been swapped out "in kind."

Milam also has two flares. There is a 4,400 scfm enclosed flare. There is also a 3,000 scfm open flare that generally works as a backup flare.

At the time of the inspection, Milam was in the process of constructing a "High BTU" plant that will treat LFG to create pipeline-quality natural gas. Construction began in the fall of 2013 and Mr. Dennison anticipates that it will be online in the fall of 2014. The system will be able to handle 3,400 scfm of gas. The High BTU plant will take LFG and remove particulate matter, non-methane organic carbon compounds, nitrogen, carbon dioxide, and sulfur compounds, and the result will be pipeline-quality natural gas. Mr. Dennison gave U.S. EPA Inspectors an informational document titled: "WM Milam Renewable Natural Gas Facility" (Attachment A).

Mr. Dennison relayed that there are about 76 wells at Milam and almost half of them have monitoring temperature variances. Temperature variances were requested because it is believed the 200-foot fill thickness and moisture (heavy rainfall) causes higher temperatures in the wells. Milam's cover has less clay and is more sludge. Ms. Onyszko asked if there are issues with fires in the landfill and Mr. Dennison said monitoring has shown there aren't fires. Carbon monoxide levels stay low.

To expand on the monitoring topic, Mr. Dennison said that well monitoring is done monthly. The landfill gas monitoring system (LGMS) has been in place for about five years. Well data that is collected is downloaded and historical data can be accessed. Carbon monoxide data is collected via Draeger tubes.

At this point, Mike McElvain joined the conversation. He is the well gas technician for the Milam, North Milam, and Cottonwood landfills. He checks static pressure and pressure differential at the wells. He also uses a temperature probe. The monitoring equipment is calibrated every day by Mr. McElvain and is calibrated by the factory every two years. Mr. McElvain checks wells on a monthly basis and more often if rechecks are necessary.

Mr. Dennison said that flares are monitored via flow meter data and temperature. This information is taken from a SD card and input to a spreadsheet. There is no one on site that is certified to read the opacity of smoke, so Milam uses a third party contractor.

Mr. Prentice asked about start up of the flare. Mr. McElvain said they are lit with propane and there is a pilot system. There is an automatic shutoff. The enclosed flare has four thermocouples. At this point, Mr. McElvain left the conversation.

U.S. EPA Inspectors asked about construction permits for Milam. Mr. Dennison said there was a construction permit to increase the volume of the solidification process. Also, there is no pug mill on site, even though there was a construction permit for it. Milam receives dusty fly ash from places like SunCoke and other power plants. A pug mill was permitted to be on site for the ash, but it can clog, so Milam instead uses Geotubes that are 100 feet long and 60 feet in circumference. Trucks pump the dusty ash into the Geotubes and that is how the fly ash goes into the landfill. Also, Milam needs to keep sulfur content less than 100 parts per million.

## **Plant Tour**

At approximately 9:50 AM, Mr. Dennison led U.S. EPA Inspectors on a plant tour. The group walked past the gas-to-electric plant to the High BTU plant. Inside the trailer was Alan Hunt, who was the project manager in town from Houston. He would explain High BTU plant operations. He began by saying the High BTU plant will tie in to the same LFG collection system that is currently in place. LFG in the system will be directed where to go, such as to the gas-to-electric plant, flares, or the High BTU plant. At the High BTU plant, LFG will be pressurized. It first goes to the sulfur treatment vessels, which are a ceramic material and iron. It is an absorbent system, and spent material will be placed within the Milam landfill in a dedicated area to prevent the fixed sulfur from reacting with other landfill material to create hydrogen sulfide.

Next, Mr. Hunt continued, the gas is pressurized again, and carbon dioxide is removed via a membrane based on its molecular size. To protect the membrane, there are prefilters to catch particulate matter, there is a pressure swing adsorption system, and there are activated carbon beds.

Non-methane organics will be sent to a thermal oxidizer, which will run all the time. There will be a propane pilot and supplemental fuel will be LFG.

Methane, nitrogen, and oxygen are now left in the gas. There is a nitrogen/oxygen rejection system in which nitrogen and oxygen are rejected and methane is absorbed. After this, the gas is recompressed, methyl mercaptan gas is added (to give the treated LFG an odor), and it is pumped into a natural gas pipeline for distribution. This concluded the High BTU plant tour.

Mr. Dennison next took U.S. EPA Inspectors to the gas-to-electric plant. There they met Roy Holland. He pointed out two of the engines and explained that the third engine was in the adjacent room because it was added after the first two. He pointed out the engine cooling system. He showed U.S. EPA Inspectors the readings he monitors on equipment in the control room. If there is a problem at the plant, he is essentially on call for 24 hours a day for seven days a week. He said the gas-to-electric plant has a capacity of 2.4 megawatts. It can power about 2,400 homes with energy.

## **Closing Conference**

Mr. Dennison and U.S. EPA Inspectors returned to the main office trailer on site. U.S. EPA Inspectors said that if anything said or provided during the inspection is considered confidential business information (CBI), it should be identified and will be treated as such. Mr. Dennison said that cost figures are CBI, but neither inspector wrote those values down in their notes. U.S. EPA Inspectors thanked Mr. Dennison for taking time out to meet with them and lead a plant tour. U.S. EPA Inspectors told them that they will discuss this inspection with their management and if more information is required from WM, they would receive an information request in the mail in accordance with Section 114 of the CAA. U.S. EPA Inspectors left the plant after 10:45 AM.

## **Attachments**

Attachment A: WM Milam Renewable Natural Gas Facility

## **Attachment A**



## Milam Renewable Natural Gas Facility

### Background:

The WM-Milam Renewable Natural Gas Center will create *pipeline-quality* natural gas from the landfill. The renewable natural gas can be used as fuel in the same as we use natural gas, such as heating homes or fueling vehicles – all made from the everyday waste that's left at the curb.

### Q & A:

#### What is the process for converting landfill gas into Renewable Natural Gas?

As waste decomposes in a landfill, in an anaerobic or oxygen-free environment, methane gas and carbon dioxide are produced. This gas is collected in wells and piped to a central location. During collection, a small amount of air enters the system, adding small percentages of nitrogen and oxygen into the gas. At Milam, a portion of the collected landfill gas is used directly as fuel in reciprocating engines to generate electricity, but most of the gas is currently burned in a flare. The Milam Renewable Gas Facility will process this extra gas by removing the carbon dioxide, nitrogen, and oxygen to produce high-purity methane that meets natural gas pipeline specifications. The Renewable Gas will be compressed and inserted into the adjacent natural gas pipeline.

#### How much landfill gas is the Renewable Natural Gas Center designed to process?

The facility can process approximately 3,500 Standard Cubic Feet per Minute (SCFM) of incoming landfill gas, equivalent to 105 Million British Thermal Units per hour. This is as much gas as it takes to fuel about 400 of Waste Management's compressed natural gas collection

trucks each day, and represents more than ten percent of the natural gas that is used in Waste Management's entire existing CNG fleet.

**When will the new facility be commissioned?**

The Renewable Natural Gas Facility is expected to begin delivering gas to the pipeline in late summer 2014.

**How many employees will the new facility employ?**

The new facility will add four full-time employees.

**Does the new Renewable Natural Gas Facility impact the existing Landfill-Gas-to-Energy-Facility?**

The existing landfill gas power plant was installed in 1991, and has a capacity of 2.4 megawatts. This plant consists of three 1,160 horsepower reciprocating engines that use the landfill gas as fuel, and drive electricity-generating equipment. From the time it was installed, it has reliably provided power to contribute to the Ameren electric distribution system. The power plant output will be directly connected to the Renewable Natural Gas Facility when it is commissioned, to provide the power to run the compressors, dehydrators, and other equipment needed to clean up the landfill gas. So, in effect, all of the landfill gas will be utilized to support the production of renewable natural gas.

**What will the natural gas be used for?**

The processed renewable natural gas will be injected into Ameren's pipeline for withdrawal at other locations for use in compressed natural gas (CNG) fueled trucks or other equipment. At Waste Management, we intend to use the gas at our own CNG fueling stations throughout the Midwest.

**What is the expected lifetime of the Renewable Natural Gas Facility?**

The operation of the Milam Renewable Natural Gas Facility is expected to continue for at least 20 years.

**How much does natural gas from landfill projects cost?**

Renewable natural gas produced from sites like the Milam facility cost more to produce than conventionally produced natural gas (at current market prices). However, because of incentives like the grant provided by the Illinois Department of Commerce and Economic Opportunity, and other tax and renewable incentives, the production and use of renewable natural gas becomes economically competitive.



**Is landfill gas really a "renewable" energy source?**

Despite our ability to recycle increasing amounts of waste, there remains a significant amount we cannot recycle. Using the methane produced in our facilities for a variety of purposes is a central part of WM's efforts in environmental stewardship. State renewable portfolio standards recognize landfill-derived methane gas as a renewable energy sources. Landfill gas is also endorsed by the U.S. Environmental Protection Agency as a viable energy alternative to fossil fuels, like coal.

**What types of permits were required for the Renewable Natural Gas Facility?**

A building permit by the Village of Fairmont City. Milam has also been issued air and solid waste permits by the Illinois Environmental Protection Agency.

**What impact does waste-based energy have on the environment?**

Waste-based energy, be it landfill gas or waste-to-energy, reduces greenhouse gases and the need for fossil fuels. The U.S. EPA has endorsed landfill gas as an environmentally friendly energy resource that reduces our reliance on fossil fuels such as coal and oil. Like wind and solar power, landfill gas is a natural resource that can be harnessed to produce green energy and has many benefits and advantages compared to fossil fuels and other alternative sources.

**How much will it cost to build?**

The new facility is an \$18.5-million dollar investment, partially funded by a grant of \$2,390,500.00 from the Illinois Department of Commerce and Economic Opportunity, and the Illinois Energy Office.

**How many landfill gas projects does Waste Management operate?**

There are now 134 projects on Waste Management landfills that use landfill gas to generate electricity, produce renewable gas, or displace fossil fuel. We have also collaborated with four cities and counties to install landfill-gas-to-energy plants on public landfills. Altogether, these projects put enough landfill gas to work to produce the equivalent of more than 680 megawatts of power capacity, enough to power almost half a million homes, and the equivalent of over 2.5 million tons of coal per year.

**How many renewable natural gas facilities does Waste Management operate?**

The Milam Renewable Natural Gas Center will be our third facility to convert landfill gas to natural gas. In California, Waste Management has collaborated in the world's largest plant to convert landfill gas to ultra-low-carbon liquefied natural gas or LNG. The greenhouse gas emissions associated with this fuel are 20 to 25 percent lower than those of diesel, and particulate emissions are 90 percent lower. It's the cleanest fuel available for heavy-duty trucks today. The facility produces 13,000 gallons of LNG per day and helps to power the company's

fleet in California. In Ohio, we process about 3,000 standard cubic feet per minute of landfill gas and deliver it to the natural gas pipeline.

**How landfill many facilities that create pipeline ready natural gas exist today?**

More than 30 facilities nationwide process landfill gas into pipeline quality natural gas. This project is unique because it closes the loop by linking to WM's own demand for CNG to fuel our trucks. WM of Illinois currently operates more than 100 CNG vehicles. This project will allow WM to use gas generated from this facility in our own vehicles.